

Amendments to the Specification:

On page 1, below the title and above "Technical Field", please insert the following new paragraph:

--This application is the United States national phase application of International Application PCT/JP2003/011883 filed September 18, 2003.--

On the top of page 5, please replace the first paragraph with the following amended paragraph:

Here,  $m$  is an ~~odd~~ integer,  $\beta_1$  and  $\beta_2$  are respectively the propagation constants of the light of frequency  $\omega_1$  and light of frequency  $\omega_2$  in the nonlinear medium, and  $\beta_3$  is the propagation constant of the light of frequency  $\omega_3$  in the nonlinear medium.

On page 7, please replace the first full paragraph with the following amended paragraph:

However, the following problems arise in a quasi-phase matching nonlinear optical element using a ferroelectric crystal. Namely, in the case of lithium niobate and lithium tantalate, temporal damage ~~the~~ ~~variation~~ in the refractive index caused by the photorefractive effect (optical damage) is a problem.

In this effect, the carrier is excited and diffused from impurities that are admixed in the crystal growth stage, so that a non-uniform distribution is produced. As a result, an internal electric field is generated, and a variation in the refractive index is generated via the electro-optical effect. This light-induced variation in the refractive index is also called optical damage; in a quasi-phase matching device, this variation causes a deviation from the phase matching conditions, and therefore causes a drop in conversion efficiency. Accordingly, this is an important factor limiting the performance.

On page 15, please replace the first full paragraph with the following amended paragraph:

The fifth invention that is used to achieve the object described above is any of the first through fourth inventions, which is characterized by the fact that the converter has means ~~an invention~~ for controlling the direction of polarization of the light that is input into the quasi-phase matched quartz crystal.

Please replace the last paragraph on page 15 which continues to the top of page 16 with the following amended paragraph:

In this invention, since there are means ~~is an invention~~ for controlling the direction of polarization of the light that is input into the quasi-phase matched quartz crystal, the direction of polarization of the light can be adjusted to a direction that is desirable for the wavelength conversion of the quasi-phase matched quartz crystal by means of this control means ~~invention~~, so that the wavelength conversion efficiency can be increased.

On page 17, please replace the first full paragraph with the following amended paragraph:

Figure 2 is a schematic structural diagram which shows a WDM wavelength converter constituting a first working configuration of the present invention. In Figure 2, an optical waveguide structure is formed in a quasi-phase matched quartz crystal 1, and V grooves 1a are formed before and after this structure. Below, a case in which a C-L inter-band wavelength conversion is performed will be described as an example. In this case, if the wavelength  $\lambda_{\text{pump}}$  of the control light is

set so that  $\lambda_{\text{pump}} = 0.785 \text{ } \mu\text{m}$ , the wave length of the  
signal light  $\lambda_{\text{in}} = 1.53 \text{ to } 1.57 \text{ } \mu\text{m}$ , and the wave length  
of the output light  $\lambda_{\text{out}} = 1.57 \text{ to } 1.61 \text{ } \mu\text{m}$ .

Furthermore, the wavelength bands of the signal light  
and output light may also be the reverse of the bands  
described above.